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PROVIDED IN THIS REPORT ARE COMPLETE TEXTS OF THE PAPERS PRESENTED AT THE SECOND RESEARCH PLANNING CONFERENCE OF "PROJECT LITERACY." THE CENTRAL THEME OF EACH PAPER IS BASIC RESEARCH AND/OR CURRICULUM DEVELOPMENT IN AREAS OF EDUCATION RELEVANT TO THE ACQUISITION OF READING SKILLS. TITLES OF THE 10 PAPERS PRESENTED ARE (1) "SPELLING TO SOUND--RULES AND A MODEL," (2) "PROPOSAL FOR A RESEARCH PROGRAM IN WRITTEN ENGLISH AND ITS RELATION TO SPOKEN ENGLISH," (3) "A PROPOSED STUDY OF NEGRO AND PUERTO RICAN SPEECH IN NEW YORK CITY," (4) "A PROPOSAL FOR THE STUDY OF THE GRAMMAR OF NEGRO ENGLISH IN NEW YORK CITY," (5) "COMMUNICATION BARRIERS TO THE CULTURALLY DEPRIVED," (6) "PREREQUISITIES FOR LINGUISTIC STUDIES ON THE EFFECTS OF DIALECT DIFFERENCES ON LEARNING TO READ," (7) "PRELIMINARY OUTLINE OF PILOT STUDIES ON RELATIONS OF COMPREHENSION AND SPEECH IN PRESCHOOL CHILDREN," (8) "LANGUAGE SKILLS IN THE CONTEXT OF THE CHILD'S COGNITIVE DEVELOPMENT," AND (10) "THE VALIDITY OF PAUSE AS AN INDEX OF UNITS IN LANGUAGE." (JH)

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PROJECT LITERACY

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Project Literacy Reports, No. 2.

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COMMENTS FOR PROJECT LITERACY MEETING

Noam Chomsky
Massachusetts Institute of Technology

Morris Halle and I have been working for several years on a study of English sound structure, some aspects of which seem to me to touch on the concerns of this meeting--in particular, on questions of dialectal variation, the psychological reality of linguistic units, and the nature of conventional orthography and its relation to the sound system.

When we consider the structure of a language we are, fundamentally, concerned with a relation of sound and meaning. The rules of the language--the rules that the native speaker intuitively commands and that the linguist tries to discover and exhibit--relate certain physical signals to certain semantic interpretations; more precisely, they relate phonetic representations of sentences to their structural descriptions. Thus one level of representation that must have psychological significance, both on the perceptual and motor levels, is the level of phonetic representation; another is the level of representation that appears in structural descriptions.

The level of phonetic representation is fairly well understood. Structural descriptions are a more obscure matter. Clearly, a structural description (adequate to express the semantic content of a sentence) must contain, at least, a representation of the meaning-bearing units of which the sentence is composed and of the phrasing of the sentence (and, of course, much more which we here disregard). Thus the structural description of the Phrase

"American history teacher" must contain the units America, -an, histor-, -y, teach, -er, and a bracketing indicating which of the two semantic interpretations is intended. Similarly, the word theatricality, for example, must be represented as a Noun derived from the Adjective theatrical, which is in turn derived from the Noun theater. Thus the grammar of a language must contain (at least) syntactic rules that determine phrasing and the placement of "grammatical" units such as -er, -ity, a lexicon that contains the semantically functioning units, and rules that convert structural descriptions to phonetic representations.

Consider now the character of the lexicon. It is easy to justify the requirement that each lexical item be represented as a sequence of segments. Each item, of course, has a unique such spelling--a single entry--in the lexicon. This spelling must contain all information not predictable by phonological rules (presupposing the rest of the structural description of the sentence in which the item is embedded). Thus the lexical representation of the common item of histor-y, histor-ical, histor-ian, or of anxi-ous, anxi-ety, or of courage, courage-ous, or of tele+graph, tele+graph-ic, tele+graph-y, etc., must be selected so as to contain just what is not predictable in the variant phonetic realizations of these items. The psychological reality of lexical representation, in this sense, is hardly open to question.

Observe that a lexical representation, in this sense, provides a natural orthography for a person who knows a language. It provides just the information about words that is not predictable by

phonological rule or by the syntactic rules that determine the phrasing of the sentence in which the item is embedded. It provides just the information needed by a person who has command of the syntactic and phonological rules (up to ambiguity). Conventional orthography, in English, as in every case of which I have any knowledge, is remarkably close to optimal, in this sense. For example, the spellings histor-, anxi-, courage, telegraph are (minor notational conventions aside) essentially what would appear in the lexicon of spoken English. Conventional orthographies tend to differ systematically from lexical representation only in that true irregularities (e.g., man - men, cling - clung) are differently represented, as is quite natural. The symbols of conventional orthography correspond to feature sets, in the underlying sound system of the spoken language.

It seems fairly well established that the level of lexical representation is highly resistant to change, and is highly persistent over time (and hence over a range of dialects). Correspondingly, one finds that conventional orthographies remain useful, with minor change, over long periods and for a wide range of dialects.

As a result of our work, we have come to the conclusion that there is no linguistically significant (and, presumably, no psychologically real) level of systematic representation intermediate between the level of representation to which conventional orthographies closely correspond and (broad) phonetic representation. These underlying representations we call "phonological," following Sapir, our conclusions being closely akin in many respects to his views on the nature of sound pattern and phonological rules.

Following this usage, we may say that the relation between conventional spelling and phonological representation is very close, and that conventional spelling is, by and large, a highly effective system for a wide range of dialects because it corresponds to a common underlying phonological representation, relatively invariant among dialects despite wide phonetic divergence. Let me emphasize again the advantages of phonological (i.e., essentially conventional orthographic) representation <u>for a speaker who understands the language</u>. In contrast, broad phonetic (or, possibly, so-called "phonemic") representation is the only kind that would be of any use for someone who knows nothing of the syntax of the language but who wishes to produce a noise which is close to the phonetic form of a sentence--for example, an actor who has to produce a sentence of a language that he does not know.

Consider, in contrast, phonemic representation in the modern (post-Sapir) sense. The phonemic system, in effect, extracts all regularities from the sound system that can be detected with no consideration (or, in some varieties, highly restricted consideration) of higher level structure. A priori, there is no reason to suppose that such a system exists. For example, it is obvious that a child does not first construct such a phonemic system and then proceed to the problem of acquiring syntax and semantics, and there is not the slightest reason to believe that there is a level of perceptual processing (or of motor performance) that corresponds to phonemic representation, in the modern sense. Furthermore, we have offered several arguments in support of the conclusion that there is no linguistic

justification for a phonemic level--that is, it can be incorporated in a full grammar only at the cost of otherwise valid generalizations. Consequently, it seems to me that phonemics, in the modern sense, is perhaps nothing more than a methodological artifact.

In considering problems of literacy, the questions of "phoneme-grapheme correspondences" and of dialect variation naturally arise. As to the latter, this is a problem only to the extent that dialects differ on the syntactic and lexical level. Differences in phonological rules are irrelevant, since orthography corresponds to a deeper level of representation than (broad) phonetic. Hence the question raised above (of uniformity of lexicon over time and dialect), and the analogous question with respect to sameness of deeper structures in syntax, becomes highly relevant. As to the question of "phoneme-grapheme" correspondence, it may be that this is something of a pseudo-issue, or more properly, a set of pseudo-issues, depending on how exactly it is interpreted. If by "phoneme" is meant the unit constructed in accordance with modern principles, there is no reason to expect any significant set of phoneme-grapheme correspondences, since it seems that phonemes are artificial units, having no linguistic status, whereas the "graphemes" of the conventional orthography do correspond fairly closely to a linguistically significant level of representation. Hence it is not clear why one should investigate phoneme-grapheme corespondences at all. (In passing, it should be noted that so far as relevant information is now available, the same seems to be true for other languages.) If the word "phoneme" is taken in the sense of Sapir, and "phonological

representation" is the level at which all predictable differences are extracted, then the phoneme-grapheme correspondences seem quite simple--they are very close to one-one, given certain notational conventions and disregarding a class of true exceptions. On the other hand, if we use the phrase "phoneme-grapheme" correspondences to refer to the study of sound-letter correspondences, we are, in effect, simply doing phonology. Or, to be more precise, the only reasonable way to study sound-letter correspondences seems to be to utilize the fact that orthography corresponds closely to a significant level of linguistic representation--namely, phonological representation, in the sense used above--which is, furthermore related to sound by general rules--namely, the rules of the phonological component. Hence the study of sound-letter correspondences can be divided into three parts: phonology, the systematic (near one-one) relations between phonological segments and letters (or conventional letter sequences), and a residue of exceptions (some of which exhibit subregularities of various sorts). But the bulk of the study is simply investigation of the phonological pattern.

If this much is correct, then it would seem to follow that the rules of sound-letter correspondence need hardly be taught, particularly the most general and deepest of these rules. For these rules are in any event part of the unconscious linguistic equipment of the non-literate speaker. What he must learn (except for true irregularities) is simply the elementary correspondence between the underlying phonological segments of his internalized lexicon and the orthographic symbols.

However, there is one qualification that must be added to this remark. The conventional orthography corresponds closely to a level of representation that seems to be optimal for the sound system of a fairly rich version of standard spoken English. Much of the evidence that determines, for the phonologist, the exact form of this underlying system is based on consideration of learned words and complex derivational patterns. It is by no means obvious that a child of six has mastered this phonological system in full--he may not yet have been presented with all of the evidence that determines the general structure of the English sound pattern. It would not be at all surprising to discover that the child's intuitive organization of the sound system continues to develop and deepen until considerably later. Furthermore, it seems that children are much more attuned to phonetic nuance than adults--they "hear phonetically" rather than phonologically, to a considerable extent. Though I have no serious evidence, I have observed quite a few cases where children developing their own alphabet or learning to read insisted on a much narrower representation than would strike the adult ear as plausible. To take one extreme case, my oldest daughter at age five objected to using the same symbol for the two Stops in cocoa, as it turned out on investigation, because the difference in aspiration seemed to her sufficiently significant to require a different symbolization. Though this is hardly better than a guess, it is not particularly a surprising one. Thus it is a familiar observation that children can mimic and can acquire a new pronunciation much more readily

than adults, and this may correlate with a more superficial (narrower) level of organization of the phonetic material. For various reasons, then, it may turn out that the psychologically real representation for the child changes and deepens with age, approaching the adult phonology with increasing maturity and linguistic experience. Serious investigation of these questions is far from easy, but it should shed much light on problems of speech perception and production and, perhaps indirectly on the problems of literacy as well.

SPELLING TO SOUND: RULES AND A MODEL

Ruth H. Weir
Richard Venezky
Stanford University

The objectives of this project are two-fold: the first is to formulate all possible spelling-to-sound correspondence rules by analyzing a tabulation of the spelling-to-sound relationships in about 20,000 English words. These rules will be based upon features of phonology, as well as morphology and syntax. The purpose of these rules is to predict with the highest possible accuracy the pronunciation of English words from their spellings.

The second objective is to present a model for spelling to sound relationships which reflects the habits of a mature adult reader.

Procedures

The basic data to be analyzed were obtained by a computer program written by R. Venezky in coordination with the Reading Research Project at Cornell University (supported by U. S. Office of Education Grant No. 639). From these data, which include spelling-to-sound tabulations, a search will be made for conditioning factors within words which indicate which of several possible pronunciations for a particular grapheme occurs. Computer studies will be used to assemble data on environmental features within words and also to test the relative accuracy of sets of rules based upon different size spelling units. The formulation of spelling-to-sound rules will be based upon techniques of description adopted by the authors from those currently used in descriptive linguistics.

To account for the phonemic and morphemic characteristics of the existing orthography, two types of correspondences have been formulated: grapheme to morphophoneme, and morphophoneme-to-phoneme. The complete description of English spelling-to-sound correspondences is composed of sets of rules for each of the two types of correspondences, and of an inventory of graphic representations of allomorphs of English morphemes. By using ordered rules on two different levels (grapheme→morphophonmem and morphophoneme→phoneme), the graphemic and morphemic aspects of the orthography on the one hand and morphophonemic alternations and phonotactics on the other can be clearly described. Thus, for example, the various pronunciations of the cluster <ch>, which depend upon whole words in which they appear are described on the grapheme→morphophoneme level. The various pronunciations of the noun plural <-s>, on the other hand, which depend upon regular morphophonemic rules, are described on the morphophoneme→phoneme level.

Within each level, rules are ordered to produce the most economic statement of correspondences. The first grapheme→morphophoneme rules account for the exceptions to the more general rules so that the correspondences in the largest number of forms can be referred to as ELSE. In the morphophoneme→phomeme rules, phonotactic rules are applied last since they operate upon phonemic units.

In reducing this description to rules for teaching reading, the graphemic allomorph inventory will contain items that must be presented in toto for predicting their pronunciations. The morpho-phoneme-to-phoneme rules represent habits that native speakers of English have by the time they attempt to read, while the other sets

of correspondences represent rules that must be taught in one way or another.

Along with the rules which will be formulated, extensive word lists for each rule will be presented.

PROPOSAL FOR A RESEARCH PROGRAM IN WRITTEN ENGLISH AND ITS RELATION TO SPOKEN ENGLISH

Charles F. Hockett*
Cornell University

The classical view of the relation of writing to speech (as expounded, for example, by Leonard Bloomfield in his book Language or, with minor modifications, by me in my Course in Modern Linguistics) held, in essence, that writing is but a record of speech. Different types of writing systems represent speech in different ways, on the basis of the type of linguistic unit assigned as the representate of the unit graphic symbol (e.g., alphabetic systems assign a written mark to each phoneme, character systems such as Chinese assign a written mark to each morpheme). Most writing systems have some intermixture between these two types, and, of course, many arbitrary irregularities. The classic view naturally leads to a certain basic policy in literacy training: essentially this policy is that if the learner is taught the correlations between graphic mark and linguistic unit, he has learned to read. (Those familiar with the literature on this topic will recognize this brief statement as a great oversimplification, but I believe it is essentially correct.)

Recent developments in theoretical linguistics, stemming from the first work of Noam Chomsky in the early nineteen-fifties, suggest that the classic view is not merely an over-simplification of the facts, which would be not very serious, but a distortion. Points that, under the classic view, have to be

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* Read by Richard Venezky at Second Research Conference

handled as "irregularities" may actually reflect a kind of regularity that is obscured by the classic approach but which should be discovered and exploited. Very briefly, the new view can be described as follows: a grammar of English bifurcates somewhere near the output end: by taking one fork, one generates written sentences: by taking the other, one generates spoken sentences. The written sentence need not be interpreted as representing a spoken sentence; rather, paired written and spoken sentences represent largely the same workings of the grammar.

It is not at all clear how this approach might suggest pedagogical procedures other than those suggested by the classical view. It would be hard for that to be clear when, at the moment, we have virtually no notion of the details, but only a very general outline of what the grammar of a paired spoken and written language may be like.

It is proposed, therefore, that we undertake these two tasks: (1) a search, guided both by modern theory and by the obvious empirical data, for the more precise nature of the grammar of spoken-and-written English and the exact location of the bifurcation; and (2) a continuation, preferably with computer aid, of the sifting and classification of English written words on the basis of spelling-to-sound correlations, on the theory that this organization of the material is essential in the long run regardless of any changes of the theoretical frame of reference.

A PROPOSED STUDY OF NEGRO AND PUERTO RICAN SPEECH IN NEW YORK CITY

William Labov
Columbia University

1. The general aims of this study may be summarized under two headings:
   a. To determine the socially significant variables in English structure which separate Negro and Puerto Rican speakers from the rest of the New York City speech community.
   b. To define those structural and functional conflicts of the Negro and Puerto Rican vernaculars with standard English which may interfere with the acquisition of reading skills.
2. The research which is proposed in the following pages is an extension of an investigation of the socio-linguistic structure of New York City, as reported in my 1964 Columbia University dissertation, "The Social Stratification of English in New York City." In this study, it was found that the extensive variation found in New York City speech was not an example of random or "free" variation, as previous investigators had reported; on the contrary, the New York City speech community showed a very regular pattern of social and stylistic variation. Almost all New Yorkers showed the same direction of stylistic shift for the variables that were studied: the level at which this pattern operated was largely determined by the socio-economic position of the speaker. Furthermore, almost all New Yorkers reacted in the same way in judging the social

significance of these variables in the speech of others, as shown by their unconscious subjective reactions to these variables.

Despite this high degree of integration of the speech community through a common set of norms, there is also evidence of a significant deviation from these norms among some sections of the population. Whereas older Negro people in New York City participate in the same socio-linguistic structure as the rest of the population, many of the Negro youth seem to be moving in a different direction, along with many Puerto Ricans and lower class white youth. Among older Negroes, there is general agreement that Southern speech characteristics are "rough" and uncultivated compared to Northern speech. Yet there has been a rapid increase in the use of non-standard forms of Southern Negro speech in recent years: in part, this is due to the influx of Negroes raised in the South, but it also reflects a reversal of the value system held by the older generation, and a rebellion against middle class norms.

3. In the proposed investigation, each of the characteristic features of Negro and Puerto Rican English will be studied in several aspects: [a] its range of variation when used by the same speaker in differing contexts, [b] its distribution through the population, [c] its social significance as shown in subjective reaction tests and direct discussions of language. In the light of this information, the characteristic traits of Negro and Puerto Rican English may be classified into three types: <u>indicators</u>, which mark the group by objective distribution, but show no stylistic variation or subjective response; <u>markers</u>, which show

stylistic variation and patterns of unconscious subjective response; and stereotypes, which may or may not show clear-cut objective distribution coincident with the group, but which fluctuate in contextual styles and are topics of overt discussion.

All of this information will be utilized in determining the over-all structure of the Negro and Puerto Rican speech communities, as sub-groups of the larger New York City speech community. Within this structure, there will be various degrees of conflict with standard English, in relation to both the spoken and written forms. These conflicts may be of two types: [a] structural conflicts--differences between the rules and structural categories of the vernaculars and standard English, at varying levels of generality, and [b] functional conflicts--differences in the value systems symbolized by the structural differences, and depending in part upon the status of the individual features as indicators, markers or stereotypes.

4. Many of the methods utilized in the earlier study of New York City will also be used for the study now proposed. Interviews with 36 adult Negro informants from the survey of the Lower East Side have already been studied in some detail, and offer possibilities for controlled comparison of a great many variables specific to the Negro group. In addition, a modified form of this interview is being used this summer with 50 delinquent Negro boys who have been sentenced to terms at state institutions, and 25 Puerto Rican boys with the same status.

Beyond these methods, it will be necessary to devise a number of new techniques to accomplish the aims described above.

a. One of the most important tasks will be the training of a Negro interviewer, and comparison of interviews conducted by him with those conducted by white interviewers. This can be done most effectively by split interviews: breaking off sessions conducted by one person, and having them completed by another. It is possible that speech obtained by a Negro interviewer will be significantly different from the most casual and spontaneous speech recorded in past interviews: In any case, resolution of this question will in itself be an important finding.

b. It will also be important to compare the speech of individuals, when they are talking alone with an interviewer, to the speech of the same individuals in the midst of their immediate group of friends and associates. Techniques of working with small groups, forming both closed and open networks, may follow those developed by John Gumperz in his recent work in Norway [reported in the forthcoming issue of the American Anthropologist on "The Ethnography of Speaking."]

c. The subjective reaction tests used in the past have been confined to the value systems which reflect middle class norms. It will be necessary to elicit and measure opposing value judgments from the same speakers, reflecting values which reinforce the patterns of working class speech in New York. Scales which allow the listener to register his

judgment of the masculinity of the speaker, his trustworthiness, or the listener's sense of identification with the speaker, must be developed.

d. The previous study was most systematic in the sampling of adult speech. It will be necessary to make more detailed investigations of children's speech, especially that of pre-adolescent peer groups, in order to study the development of verbal skills. From evidence already gathered, it appears that children first learn to read fairly early in the sequence of acquiring skill in the use of standard spoken English: The recognition of the social significance of vernacular forms, and the use of many superimposed styles of careful speech, are often not learned until the late teens. It will also be possible to investigate the suggestion of Noam Chomsky that children may not have the same morphophonemic system as their parents, since they are not familiar with the patterns of morphophonemic alternation that depend upon less common words of Romance origin.

e. For the systematic investigation of the English spoken by Puerto Rican youth, it will be necessary to conduct parallel studies in Puerto Rican Spanish--first, to determine the main patterns of bilingual interference, and second, to isolate the socially significant variables in Spanish as possible prototypes of similar variables in the English used by this group.

A PROPOSAL FOR THE STUDY OF THE GRAMMAR OF NEGRO ENGLISH IN NEW YORK CITY

Beryl Loftman Bailey
Hunter College

Aims

To analyze the grammatical structure of Negro English, to discover significant deviations from the standard vernacular.

To determine how far these structural differences are responsible for interference in the acquisition of reading skills.

Background

The proposed project will extend the work begun by the investigator in her recent analysis of the structure of Jamaican Creole. See her 1964 Columbia University dissertation. Jamaican Creole Syntax: A Transformational Approach. The report of a study of the socio-linguistic structure of the New York City speech community by William Labov indicates that the structure of the vernacular plays the most important role in the child's success in learning to read and that in turn the failure or success in learning to read may set the pattern which affects the acquisition of other language skills.

In Labov's New York City survey, he found that the number of non-standard grammatical forms used by Negro subjects was of a much greater order of magnitude than the number used by whites. Some of these non-standard features--such as double negatives, or simplification of consonant clusters--are also found in the speech of whites. Others are apparently limited to Negroes: for example, the double plurals mens, teeths, alphabets, peoples, or the absence of the copula in predication: you weak, man.

Such special forms, which are in practice confined to Negro speakers, raise the question as to whether the grammar of Negro speech reflects an underlying Creole grammar. The assumption behind such a possibility is that there was a Creole spoken throughout the South and possibly, also in the North, during the early days of slavery, with a syntax similar to that spoken in many parts of the Caribbean today, in the islands off the coast of Georgia and South Carolina (Gullah), and also to that spoken in Sierra Leone and the Cameroon off West African coast. In none of the Creole languages, for example, does a copula accompany the predicate adjective.

The significance of such a finding, that an underlying Creole grammar has affected the grammar of present-day Negro vernaculars, would be that the non-standard features of Negro speech are more deeply rooted, more systematic, than previously considered. If such features are only isolated remnants of hetergeneous rural English dialects, they would resist any attempts to organize them into an integrated grammar comparable to those of Caribbean Creoles. Such a finding would lend strong support to Stewart's suggestion that the techniques of foreign language teaching to be applied to the teaching of standard English.

> ...since the individual cases of mismatch may derive from more general deviations in the overall organization of the two verbal systems themselves, it seems clear that isolated 'mistakes' will not necessarily be amenable to patchwork correction.

The need for a systematic description of the grammar of the Negro vernacular is of course independent of the historical question raised here, since effective methods of teaching standard English require

the most general and precise statement of the differences in structure between the two systems.

Method

The Negro vernaculars will be analyzed on the principles of the transformational model. This will give the general rules which govern the pattern of speech production, rather than an inventory of the forms used in any particular body of speech.

As a first step in such a description, tape recordings of interviews with sixty Negro speakers from the 1963 survey of New York City will be analyzed for specific areas of concentration. The linguistic interview used in this survey was designed to isolate a wide variety of contextual styles, from the most casual speech to the most formal reading style. The sections of speech in each interview which can be identified as casual or careful speech have already been marked, through the use of both contextual and channel cues independent of the variables being studied.

New informants will then be selected for further study: four for detailed work, twenty for recording short stories and conversation, and others for short recording sessions. The grammatical statements resulting from these studies will be compared with those of standard English, with forms of provincial English which are said to underlie non-standard speech, and with Creole syntax.

The grammatical rules which are characteristic of various New York City Negro vernaculars will then be treated as social variables, and their distribution in various stylistic contexts will be charted among the various subgroups of the New York City sample, according to:

geographical background	sex
education	age
occupation	reading ability
socio-economic class	general attitudes towards language

The degree of interference in the acquisition of reading skill from each of these variables can then be analyzed (1) empirically, by correlating reading ability with these variables, and (2) abstractly, by stating the general rules needed to convert the vernacular to standard English.

A further source of linguistic material will be provided by fifty interviews with delinquent Negro youth, now being conducted in a project of Mobilization for Youth.

A DESCRIPTION OF THE CHICAGO SPEECH SURVEY

COOPERATIVE RESEARCH PROJECT 2107
COMMUNICATION BARRIERS TO THE CULTURALLY DEPRIVED

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Illinois Institute of Technology

Raven I. McDavid, Jr.
University of Chicago

The Chicago Speech Survey, begun in October, 1963, to investigate social differences in the speech of Chicagoans, uses the interview techniques of the Linguistic Atlas. Fifty taped interviews have been made by John Willis, graduate student at the University of Chicago, Melvin Hoffman, graduate student at IIT, and Lee Pederson, assistant professor of English at the University of Minnesota. These interviews sample the speech of ten middle class whites, ten middle class Negroes, ten lower class whites, and twenty lower class Negroes. Ten of the Negro interviews are with recent in-migrants, and three of the lower class whites interviewed were poor Southern in-migrants.

The questionnaire used is a shortened form of the Atlas worksheets, reduced to approximately 250 items. Much of the shortening was made possible by the elimination of rural vocabulary items and those items which were otherwise judged likely to be unproductive. Most of the items were chosen for phonological reasons; they include cardinal and ordinal numerals, days of the week, months, parts of the house, cooking terms, parts of the body, illness, etc. Grammatical items include the forms heard, haven't (for ain't, hain't), he does, I am going, am I going?, am I not?, we were, it wasn't me, brought, bitten, the personal pronouns, ate, eaten, drank, drunk, sit, sat, those, didn't

use to, caught, took, taken, sweated, swam, dived, drowned, climbed, kneeled, woke, written, taught, gave, began, ran, came, saw, torn up, did, fought, might, isn't doesn't. In order to stimulate conversation with Negro informants one new vocabulary item was added, soul food, meaning excellent Southern cooking.

Samples of connected speech, some of them several minutes long, accompany most of the interviews. These follow no set pattern in subject matter. Their purpose is to provide data for a comparative study of the paralanguage (such features as tempo, intensity, pitch range, nasality, rasp, drawl, clipping, etc.). Although the importance of paralanguage has been demonstrated for the analysis of psychiatric interviews, this is, we believe, the first attempt to include paralanguage in dialect studies. Difficulties in handling such data are enormous. Dr. William Austin, who is analyzing the data, believes they will prove to be of great significance.

It had been hoped that it would be possible to program the raw material from the interviews for the computer. At this time, it does not seem to be feasible. The tapes are now being studied and charted in the usual Atlas fashion, and the conclusions will be available in the project report to the Office of Education in the fall of 1964.

Some generalizations which can be made are that the middle class white has the expected Inland Northern educated pronunciations and grammar, lower class native whites show a greater Midland influence such as 'open o' in on, and more relic forms. Middle class Negro speech tends to approach the middle class white norms, with one interesting exception that aunt is always pronounced with the low central

unround vowel. As one moves down the social scale he finds Negro speech to be more and more like that of lower class recent Negro in-migrants.

The next phase of this study, scheduled for early fall is the measurement of attitudes toward speech forms and samples of connected speech. Judges will be selected from middle and lower class whites and Negroes. They will rate the speakers on the social scale, or possibly by occupation and education, and will also indicate whether they find the speech to be pleasant or unpleasant.

From the data of this study and other supporting information which has been gathered, a manual for the use of teachers in the Chicago schools is to be prepared during the coming academic year, in the belief that an understanding of the child's linguistic differences will better prepare the teacher to cope with the language learning situation.

PREREQUISITES FOR LINGUISTIC STUDIES ON THE EFFECTS OF DIALECT DIFFERENCES ON LEARNING TO READ

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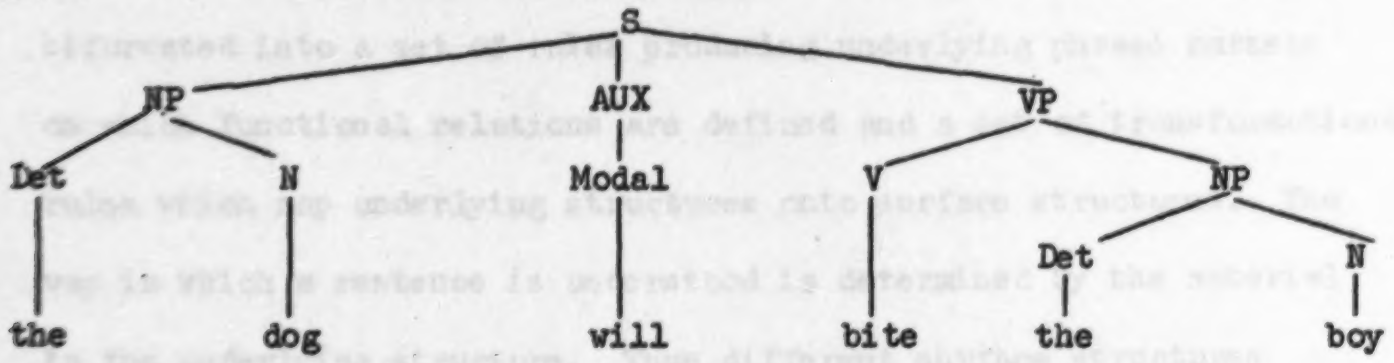
Linguists and educators have suggested that dialectal variation in phonology and syntax may contribute to reading difficulty. Requisite to the set of systematic procedures for verifying this hypothesis is a characterization of the notion dialect in terms of a precise linguistic theory which can provide the basis of an explanation of how sentences, written or spoken, are understood and how this linguistic ability is learned by the child.

Transformational grammar is an attempt to represent the linguistic knowledge which a speaker must possess in order to utter and comprehend the infinite number of sentences in his language. The fact that no one can learn a language by memorizing all of its sentences requires that the speaker's knowledge, the grammar of his language, consist in part of a finite set of recursive rewriting rules of the form A---->+C, C--->A+D. Applied over and over again, i.e., recursively, these rules produce an infinite set of sentences like BAD, BBCD, BBADD, and so forth. To the extent that rewriting rules are capable in principle of enumerating all and only the sentences of a given natural language, we can approach the problem of language learning on the reasonable assumption that a child develops a finite set of rules which permit the realization of an infinite number of sentences.

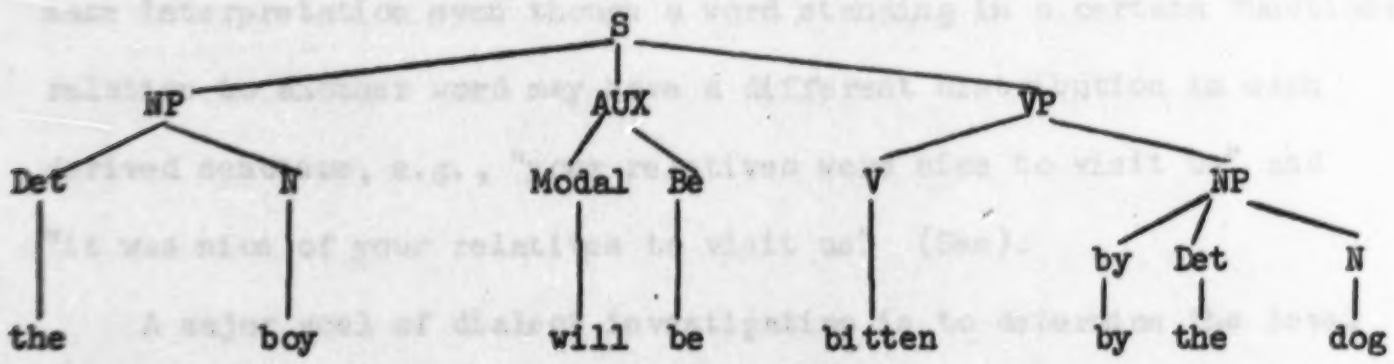
Other aspects of linguistic competence, such as the ability of the speaker to determine when two sentences are synonymous, suggest

that the grammar must contain certain machinery in addition to rewriting rules. Let us suppose that the grammar generates independently the two sentences "the dog will bite the boy" and "the boy will be bitten by the dog." The output and the derivational history of the rewriting rules can be graphically represented by tree diagrams or phrase markers.

(1)



(2)



In both sentences produced in the above phrase markers "the dog" is interpreted as having the subject-verb relation to "bite." Similarly, the verb-object relation obtains between "the boy" and "bite." Since these relations are not associated uniquely with the positions of "the dog" and "the boy" in the phrase markers, and since any significant grammar must explain the speaker's ability to make such associations, we are forced to postulate a more abstract structure underlying the two sentences, one on which functional relations are uniquely defined. More specifically, we postulate an underlying phrase marker, generated

by rewriting rules, which resembles (1). The subject-verb relation can be defined uniquely as the function NP of S and the verb-object relation as the function NP of VP. Phrase marker (2), however, is not generated independently. Rather it is derived by a mapping or transformational rule which converts phrase marker (1) into phrase marker (2). The syntactic component of the grammar is thus bifurcated into a set of rules producing underlying phrase markers on which functional relations are defined and a set of transformational rules which map underlying structures onto surface structures. The way in which a sentence is understood is determined by the material in the underlying structure. Thus different surface structures derived from the same underlying structure necessarily receive the same interpretation even though a word standing in a certain functional relation to another word may have a different distribution in each derived sentence, e.g., "your relatives were nice to visit us" and "it was nice of your relatives to visit us." (See).

A major goal of dialect investigation is to determine the level on which dialects differ from one another. Do dialects of English differ only on the surface level, i.e., in the transformations mapping underlying structure onto surface structure, or are their underlying structures distinct? To date there has been no transformational research to speak of in syntactic dialectology, but we might consider the kind of data which could be found. Consider the following three sentences as representative of different dialects.

D-1 Johnny hates it for his father to spank him

D-2 Johnny hates for his father to spank him

D-3 Johnny hates his father to spank him

For reasons which are independent of the above examples, the grammar of English must contain the following transformational rules (see):

Rule 1 Separate "for" from "to" when the "for-to" configuration appears as the auxiliary in a complement of a noun and the head noun has not been deleted, e.g., "the plan for Bill to come."

Rule 2 Delete "it" before a sentence. Thus, from the underlying structure "I think it that Johnny is smart" we derive "I think that Johnny is smart." Note that "it" is not deleted when it does not immediately precede a sentence as in "it is thought that Johnny is smart."

Rule 3 Delete "for" when it immediately precedes "to." When "for" is not separated from "to" by Rule 1, as in "I ordered Billy for to come," the "for" must be deleted giving "I ordered Billy to come."

Employing these rules, the three dialects can be described quite simply in terms of rule ordering or non-application. For instance, for D-1 Rule 1 applies, Rule 2 is non-applicable in this dialect, and Rule 3 cannot apply if Rule 1 precedes it. For D-2, Rule 1 applies, then Rule 2, and Rule 3 again cannot apply. For D-3, Rule 2 applies first. Rule 1, therefore, cannot apply and Rule 3 must apply.

Similarly, for the case of copula absence recorded by Labov and Bailey (See), it is not necessary to postulate that this dialect differs in underlying structure from standard English. Indeed, this is false since the presence of the copula in the underlying structure must be assumed in order to account for its presence in past tense and question constructions. The absence of the copula suggests an extremely low-level transformational rule which deletes the copula when it occurs in active non-negative present tense sentences.

The transformational approach to dialect study permits a precise and insightful characterization of the relatedness between grammatical systems. Although it is still too early to discuss the meaningfulness of the definition of dialects as differing from some real or imaginary standard language only in the transformational apparatus which derives different surface structures from common underlying structures, the examples discussed earlier suggest that syntactic dialectal variations are not as deep in the linguistic system as they might appear. The transformational approach also allows investigation of the constraints on dialect divergence. Assuming that dialects differ only on the transformational level, it is unlikely that all possible alterations in the transformational machinery are to be found, e.g., the non-application of all transformations. It is not inconceivable that dialect difference does play some role in learning to read. But prior to this question comes the need to develop a motivated methodology for describing and relating different linguistic systems. The results of transformational linguistics can provide the kind of knowledge which must be a prerequisite for a significant dialectology.

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PRELIMINARY OUTLINE OF PILOT STUDIES ON RELATIONS OF COMPREHENSION AND SPEECH IN PRE-SCHOOL CHILDREN

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A much-needed "New Look" in studies of child language learning, characterized by the work of such people as Roger Brown and his associates, Susan Ervin and Wick Miller, and Martin Braine, has emphasized the creative and original aspects of the child's learning, and have minimized the role of imitation, the traditionally overburdened explanatory device in this field. While this change in emphasis has been salutary, I should like to return to the study of the child's imitation of language in order to elucidate (1) its role as an aid in the acquisition of syntax and semantics, and (2) some of the determinants of early telegraphic speech, especially the relationship between speaking and understanding.

The age range of interest is roughly between 18 and 30 months--a most difficult age at which to secure the cooperation of subjects. The long-range goal of the investigation is the longitudinal study of a number of children in their homes. This phase will be preceded by pilot work with two-year-old pre-schoolers in order to develop comprehension tests, and to explore relationships between characteristics of model sentences and their repetitions by children.

Spontaneous Imitation and Expansions

In the course of a day at home a little child spends much of his time repeating the speech he hears around him. One cannot generalize about the role of this imitation, since it clearly serves many functions, but at least some of these functions seem to be related to

language learning. Of special interest is the nature of a child's response to adult imitations of his own speech--what Brown and Bellugi (1) have called "expansions." The telegraphic speech of children of this age is often filled out by immediately following adult interpretations. I have observed that children frequently imitate such adult expansions of their speech, and that, in these imitations, the child can often expand his original utterance to the limits of his usual productive capacity, or a little beyond those limits. The child's imitation of expansions of his own speech may play an important role in grammatical and semantic learning.

In this research I will be interested in finding out something about the different ways in which mothers use, and children imitate, expansions. I will want to know how imitations and expansions are used at various stages in the child's linguistic development and to study expansion and imitation between siblings. In visiting homes, I would also like to try acting as an expander myself doing a lot of expanding, to see what sorts of expansions tend to be spontaneously imitated and observing the children's reactions to obviously incorrect expansions.

At the same time, following closely several children between the ages of 18 and 30 months, I will be interested in studying relationships between what they can imitate and what they can understand. The same sorts of sentences can be presented again and again to discover the order in which new elements are added to repetitions. Other tests can continually test the comprehension of those elements.

Comprehending and Speaking

Animals, little children, anarthric children (3) and others, can respond appropriately to linguistic utterances which they themselves cannot produce; it has long been affirmed that growing children can understand linguistic forms which are not yet part of their own speech. Fraser, Bellugi, and Brown (2) tested this assumption with three-year-old children. Defining comprehension of sentences in terms of correct identification of pictures of their referents, and defining production in terms of uttering appropriate sentences in regard to pictured referents, they found comprehension to be more advanced than production. However, if production was defined in terms of imitation of sentences, it was found that children could imitate sentences which they could not understand. This latter finding implies that a child need not understand a sentence in order to imitate it correctly.

However, the work of Menyuk (5) with nursery-school and kindergarten children, and the work of Lenneberg et al. (4) with mongoloid children, suggests that there is a close relation between the grammatical complexity of a sentence and a child's ability to repeat it correctly. These studies imply that in order to reproduce a grammatical form one must first have some ability to produce it on one's own.

These apparently incompatible implications can be reconciled if one distinguishes between uncomprehending and comprehending imitation. If a sentence is short enough to be held in immediate memory, it can probably be echoed back--played back out of the "echo box," as it were. This is probably what was found by Fraser et al.; the sentences used

in their experiment were short enough to be echoed back by three-year-olds. Sentence imitations of two-year-olds, however, tend to be "telegraphic"; that is, the child will generally repeat some of the main content words (in their proper order), and leave out inflections (plural, possessive, etc.) and function words (articles, prepositions, auxiliaries, etc.). These are the very items upon which the comprehension of the sentences used by Fraser et al depended. It is still an open question whether children who omit these functions can understand them: this is one of the questions to be investigated.

Comprehension tests are being developed in order to discover whether the child can understand the elements missing from his telegraphic speech--whether he can process more material in decoding than he can in encoding. I have been working with two basic sorts of comprehension tests--object manipulation and picture identification. For example, a child can be given a toy car and a toy train and asked to show "the car is pushing the train," "the car is getting pushed by the train," and so on. In order to test the understanding of a preposition in the absence of other cues a child can, for example, be given a block and a box and be told to "put the block on the box." If his imitation of this sentence is telegraphic, he can later be asked to imitate and show comprehension of re-arrangements of the sentence: "Put on the box the block"; "Put on the block the box"; "Put the block the box on"; etc.

Another sort of comprehension test being developed involves hiding a toy under one of two or three boxes, and describing its location in terms of objects placed on the boxes--for example, "the box with the

car," or "the box with the cars."

I will also experiment with picture tests of the type used by Fraser et al.

The following are among the grammatical features being investigated: prepositions (in, on, under, next to, between), indefinite and definite articles, singular and plural (noun and verb inflections), affirmative and negative, possessive, active and passive voice (standard, and the colloquial "got" + participle), and a variety of conjunctions, conjunction deletions, and elliptical sentence patterns.

It is also of interest to discover how well a child can understand his own language at a later time. He can be asked to tape-record instructions, or descriptions of similar pictures, and his comprehension of these recordings can then be tested.

Signal Determinants of the Child's Linguistic Competence

It has been suggested that characteristics of the linguistic signal itself--chiefly its stress and intonation patterns--determine which elements the child will hear and understand. An attempt will be made to untangle a number of these suggestions by experimenting with a variety of sentence models presented for repetition to two-year-olds.

For example, it has been proposed that one reason a child's imitations are telegraphic is because he does not repeat unstressed words. Accordingly, I will present sentences for imitation in which stress patterns are changed.

It has been suggested that function words are omitted because they are redundant and meaningless. Sentences will be presented for imitation in which the placement of function words is shifted, and in which

function words are replaced by nonsense words. It is also possible to present sentences for imitation in which it is meaningful to stress the function words--for example: "The ball is not in the cup. The ball is on the cup." It is thus possible to compare the effects of stress alone, and stress in combination with meaning, in the imitation of elements normally omitted from the child's speech. In the latter case, it is also possible to ask whether imitation will be improved if the referent objects are present, giving the child something to hold in immediate memory and perhaps allowing him to generate a longer sentence in repetition.

In order to examine the proposition that meaningfulness and familiarity determine the words selected by a child for repetition, Jabberwocky-type sentences, in which only the function words are familiar, can be presented for imitation.

* * *

In the course of the coming year I hope that many of these rough porposals will be sharpened up.

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LANGUAGE SKILLS IN THE CONTEXT OF THE CHILD'S COGNITIVE DEVELOPMENT

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In order to understand the processes that underlie the child's acquisition of language skills, in general, and reading in particular, it is essential to consider these functions in a broad framework including non-linguistic aspects of cognitive development. To this end, we will first draw an outline of the child's mental development, and then attempt to see how language fits into the picture.

Child Dominated by Immediate Stimuli

The main thesis to be put forward is that the child's behavior is governed more intensely by the effects of immediate stimuli than by ideational processes such as sets, rules, and plans. Evidence to support this thesis will be cited from the works of Luria, Bruner, Vygotsky, and from free association experiments.

Luria's work on the role of language in the regulation of beahvior. Luria (1961) studied the relative powers of immediate stimuli and ideational processes in situations where these two factors lead to competing responses and found that the immediate stimuli dominated. In one of his investigations, for instance, he found that children four or five years old could be regulated by an initiating instruction, such as "Start squeezing the balloon," but not by a cessation instruction, such as "Stop squeezing the balloon," Rather than achieving its desired effect, the latter-type instruction would intensify the on-going activity. Apparently, an instruction can

exert an effect when nothing in the child's immediate environment opposes it, but does not yet have the power to counteract the influence of the activity in which the child is engaged.

Bruner's work with conservation tasks. In a typical conservation experiment, a child would be shown two equal-sized beakers filled with water to the same level. The water of one beaker would then be poured, in the sight of the child, into another, narrower or wider, beaker. To the question if there was the same to drink in the new beaker as in the beaker that remained filled, the child's answer would usually be "No." Bruner (1964) reports a variation on this procedure which highlights the interpretation that the child does possess the notion of volume conservation under transformations in the shape of the container, and his failure to manifest conservation is due to the competing effects of the visual stimuli. Instead of allowing the child to see the new beaker, it is covered from his view by a screen, and the child watches the pouring operation. Under these circumstances, his answer to the standard question is: Of course it is the same, you just poured it. If the screen is now removed many children will change their minds and insist that the two beakers do not contain the same amount of water because the water comes to different levels. The failure of the logical rule to shield the child from the compelling effects of the appearance of the visual displays is probably due to its relative weakness at this stage of development.

Vygotsky's work on children's semantic system. Vygotsky (1962) characterizes children's modes of grouping as complexive. When asked, in an experiment, to put with a sample block, all the blocks that go

with it, children would form chains where only neighboring blocks shared attributes. For instance, a green triangle may be placed with a blue triangle and then a circular block, which does not share any feature with the green triangle, added. The switch from one basis of grouping to another seems to reflect the child's inability to be guided by a single principle under varying influences of immediate stimuli.

Children's associations. It has been observed that children's free associations differ from those of adults. Adult responses were described as paradigmatic, or homogeneous with respect to part of speech, and children's associations as syntagmatic, or heterogeneous with respect to part of speech. An adult would generally respond to a noun with another noun (man-woman), to a verb with a verb, etc., while a child is likely to associate a noun with a verb (man-work) and a verb with a noun (go-home). The label syntagmatic gives the impression that children's associations are guided by the grammar of their language. It is proposed here that this inference is misleading and that the distinguishing feature of a child's associations is the relative absence of any general guiding plan, be it a rule of grammar or anything else. Rather, the child responds to each word on the basis of immediate impressions arising from the word and other aspects of the environment. In his associations as in other aspects of his behavior the child is stimulus-bound. His responses are pragmatic rather than syntagmatic. The present interpretation is amenable to experimental test. If sets or plans do not exert a strong guiding effect on the child's responses, then experimental

manipulation of instructions should produce smaller variation in the responses than manipulation of the stimuli.

Cognitive Development and Language Development

The child's cognitive behavior can thus be characterized as submissive to sensory stimulation and disrepectful of the authority of plans, guiding principles and rules. Yet in the area of cognitive behavior there seems to be an exception to this general trend: in his speech, the child appears to obey more or less slavishly the rules of grammar of the language he is using. As was shown by Chomsky, such obedience entails competence in a system of very abstract structures of linguistic units and rules for their combination and transformation. The discrepancy between the level of syntactic functioning of the child and his stage of development in non-syntactic cognitive behaviors. including the semantic component of language, demands some attention.

One possible solution to this problem is to postulate a specialized device for analysis of linguistic input, the kind of device envisaged by Chomsky (1962) and termed "universal language-learning device." According to this hypothesis, the device is specialized because it is adapted only for the processing of linguistic data whose output is the grammar of the language and is not competent to deal with other data. This is not an unreasonable hypothesis in view of the observation that people who in other behaviors exhibit a low level of cognitive development, can, apparently, speak their native tongue as well as acquire other languages with great ease.

An alternative hypothesis would turn the tables around and claim that even grammatical rules are not strong enough to counteract the effects of immediate stimuli. Thus, for instance, a child who is able to produce the past tense when the situation calls for it, may not be able to do so when stimuli indicating presentness act upon him, as when he is looking at a picture depicting an on-going activity. Research in this area would contribute to our understanding of the place of language in the over-all framework of cognitive development.

Cognitive Development and Reading

In learning to read, the child has to form a relation between orthography and speech. One would suspect the establishment of a relation between these two systems to be affected by the nature of the relation for the child between speech and reference.

The scanty evidence available supports the notion that for the child words and objects are more closely associated than for adults. Vygotsky (1962) reports experiments where children would not permit the word-names for objects to be interchanged. If replicated, these results may mean that the word for the child is not unlike a picture of the thing. Certainly, even adults would object to representing a cow by a picture of a pencil, and a pencil by a picture of a cow. This interpretation is consistent with Bruner's (1964) characterization of the child's representational system as iconic rather than symbolic and with Piaget's (1955) observation that children abhor arbitrariness and attempt to "justify everything at all costs." How could a child who cannot permit arbitrariness

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A STUDY OF SEQUENTIAL SPEECH IN YOUNG CHILDREN

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Problem:

The ways in which humans selectively filter, internalize and transform the continuous stream of stimuli impinging upon them is of central concern to the psychologist. He is practiced in examining input-output sequences under a variety of physical and social condition and at guessing at the characteristics of organizational processes which occur within the organism under these conditions. Yet, while human speech is one of the most abundant of the inputs affecting socialized man, the behavioral scientist has devoted little attention to the organizational processes involved in the reception and storage of sequential speech. In fact, the greatest part of the research in verbal behavior has focused upon input-output sequences in which isolated words were used as stimuli.

Since words seldom occur in isolation under natural circumstances, the relevance of this kind of research to the manifold theoretical and applied problems of language acquisition is brought into serious question. The need for fresh approaches in the study of language acquisition is of particular urgency at present. The behavioral scientist increasingly faces the responsibility for developing programs to help solve the problems of semi-literacy and related difficulties of those whose language skills are less than adequate to meet the demands of a highly technical society. To do an affective job of planning and developing, he needs a systematic

body of knowledge about language acquisition which is more directly relevant than that currently available.

The projected research program offers a new approach to the study of language by concentrating on the processing of sequential speech. An attempt will be made to further develop a series of techniques now being explored.

Study:

The retelling of stories has been found to be a promising method in the study of sequential language. For the study of children's language, stories as "input" material are a natural. Investigators in that area have long assured us of the importance of "being read to" in the acquisition of proficiency in language. The proposed program of research will examine the variation in children's language as a function of certain types of (a) experimental and (b) instructional conditions. By examining the transformations that the stories undergo when retold by children, we should be able to uncover patterns of variation for children with varying degrees of experience with language. Thus models of underlying organizational structures involved in storage and recall may be inferred.

A group of four-year-olds (size of sample at present undetermined) entering pre-school programs will serve as subjects. The sample will be drawn from the lowest socioeconomic levels.

a. During the early sessions of story retelling, the effects of these experimental conditions will be investigated:

1. Different story readers, with whose phonological patterns the child has varying degrees of familiarity

2. The presence or absence of pictorial cues from the story book during the reading and/or during the retelling period.

3. Varying time lapses from reading to retelling

4. Single presentation of the story and single retelling vs. multiple retelling of the same story

These variations in the simple retelling design will be introduced to discover changes in the organizational processes assumed to underlie the reception, storage and recall of the stories read to the children.

b. Projected analyses: Only a few children and adults are able to recall verbatim long sequences of language.[1/] For most adults recall involves some modification of the original account. Thus it seems reasonable to assume that during the process of 'internalization' (while the text is being committed to memory), what has been heard undergoes some form of simplification into a sequence of key words and concepts. During recall, it is this internalized and probably simplified version of the original story which is re-expressed in communicative language.

The primary emphasis in this study will be on elucidating the cognitive and organizational features of the retold stories. During the preliminary research we have found that the retold stories reveal a variety of patterns: some were almost verbatim accounts

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1/ To date, the book which has been used in the story re-telling sessions is Curious George, by H. A. Rey. Almost all the children in our current studies would recall phrases such as "the houses looked like toy houses and the people looked like dolls," while statements concerning the internal states of the 'hero,' e.g., "George was frightened," were rather uniformly omitted by the six-year-old children we have been working with.

of the original; others were well sequenced but with no logical relationships between episodes. Some were highly logical, but revealed great variations in the actual wording; others were imaginative but in jumbled sequences.

Comparing the input story with the variations in re-told stories should suggest models of the organizational processes underlying these modifications. The use of pictures during the reading as well as the retelling of stories has focused our attention on some of the "iconic" features of children's cognitive processes. The proposed variations in the method of presentation will allow a closer examination of a greater variety of organizational processes involved in the reception and storage of sequential speech.

Attention will also be given to exploring characteristic <u>phonological</u> features of the children's speech. Labov in his study of New York's multiracial residents of the Lower East Side[2/] found certain phonological features to be highly consistent among the Negro speakers, except for those who had no Negro friends during their formative years. In this study the influence of various environmental conditions will be examined effecting the phonological and cognitive features of children's speech, included among these are the opportunities of young Negro children to associate with white peers, and/or white teachers.

The examination of these samples will be in terms of characteristic features, to include:

2/ Labov, W. Phonological Indexes to Social Stratification. Paper read at the 62nd Annual Meeting of the American Anthropological Association.

1. phonological features (e.g., voicing-devoicing deviations, deviant stress and intonation contours, phonemic confusions and omissions)
2. morphological features (e.g., overgeneralization of present tense verb forms and related problems which may result from either phonological or morphological confusions)
3. organizational features (e.g., adequacy of presentation, in terms of inclusion of relevant details from the story, effectiveness of sequencing and transitions)
4. hesitation phenomena, including correction patterns (e.g., repetitions, syntactic reversals, stuttering, false starts, etc.)
5. error patternings (e.g., consistency in misuse of lexical items, syntactic deviations, etc.)

These analyses will be related to the various ways in which the original story was presented, and then transformed in the process of storage and retelling. For instance, when the story is read by an older sibling, with whose dialect the subject is familiar, does the child recall a greater percentage of the original words than when his teacher or a white examiner reads to him? Or, how much of a modification takes place in context and/or wording with multiple retellings?

c. Changes in speech patterns as a function of different instructional conditions. An attempt will be made to choose children about to enter into pre-school programs of the following compositions:

1. The teacher as well as the children are drawn from the low socio-economic Negro neighborhoods of the city.
2. The teacher is white and presumable middle-class, the children are drawn from the same setting as above.
3. The teacher is white and the children represent a heterogeneous group in terms of ethnic membership and social class.
4. Same as above (3) but the teacher of this mixed group is Negro.

The four groups of children will have story retelling sessions before their first year of pre-school, or kindergarten[3/]; and at the completion of their first year of schooling. Some record will be kept of the degree of association of children from varying backgrounds in the heterogeneous class.

A comparison of group trends will be made in the changes which occur during story retellings. We expect that striking phonological changes will take place in the youngsters in the heterogeneous group. The major question, however, is: Will these phonological changes be accompanied by major cognitive changes, or will the cognitive changes be of the same magnitude as those which characterize the children in the other settings?

3/ In case we have difficulty locating pre-school programs with a heterogeneous composition, or in case the technique of story telling is found too difficult for four-year olds, we will use kindergarten children who have not attended pre-school programs.

THE VALIDITY OF PAUSE AS AN INDEX OF UNITS IN LANGUAGE*

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A series of five experiments was carried out to assess the validity of pause in speech as an index of unit boundaries in language. The criterion for the existence of a unit was resistance to fracturing. It was hypothesized that portions of utterances segregated by pauses would behave as units--i.e., resist fracturing.

The general procedure was similar for all of the experiments. Undergraduate freshman and sophomore girls learned versions of stories or word lists, depending on the experiment. All of the stories or word lists were presented to the subjects in a monotone from a tape recorder. The stimulus material was repeated before each trial, and the trials continued until the learning criterion was achieved. The subject's output was taped in every instance.

The subject returned for a second session either 24 hours or one week later, depending on the experiment. In the second session, the subject's first task was to recall the first story (or list) she had learned in the first session. The primary purpose of this recall was to provide some control for difficulty differences in the stimulus material and for differential impact of time on the subjects.

The recall of a story or list was followed by the experimental condition in which the subject learned a mutilated version of the material she had learned in the first session. The general procedure

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used in manufacturing the mutilated versions was as follows: Verbal stimulus material learned by the subject was fractured into parts in two different ways--at points where the subject paused, and at points where there was no pause. The parts thus obtained were placed in a random order forming two new sets of verbal material which the subject was required to learn. According to the hypothesis, it should be easier to learn the mutilated version which contains parts obtained by fracturing at pauses rather than at no-pause positions.

In every experiment, it was more difficult to learn the material constructed from the non-pause fractures. The same result was found for both narrative and for non-narrative material (which was minimally syntactically organized). The result persisted when the non-pause material for one subject was another subject's pause-fractured material (the switch-pause condition). This latter result was replicated in three of the experiments and indicates that pause is sensitive to individual differences in how verbal material is organized.

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